

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
1	BRS	L1	35	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3) with (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same transmit\$4	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 17:09	
2	BRS	L2	105	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3) same (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same transmit\$4	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 16:46	

	Error Definition	Err ors
1		
2		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
3	BRS	L3	39	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3) same (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same (PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DPLL\$1 or PDLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1)	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:04	
4	BRS	L4	70	2 not 1	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:03	
5	BRS	L5	15	4 and (PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DPLL\$1 or PDLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1)	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:07	
6	BRS	L6	55	4 not 5	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:07	

	Error Definition	Err ors
3		
4		
5		
6		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
7	BRS	L7	50	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 or first adj3 second adj2 delay\$3 or plural\$3 adj2 delay\$3 or multi\$3 adj2 delay\$3) with (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same transmit\$4	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 17:14	
8	BRS	L8	15	7 not 1	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 17:13	

	Error Definition	Err ors
7		
8		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
9	BRS	L9	43	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 add\$3 or first adj3 second adj2 delay\$3 or plural\$3 adj2 delay\$3 near3 combin\$3 or multi\$3 adj2 delay\$3 near3 combin\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 combin\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 sum\$5) with (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same transmit\$4	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:17	
10	BRS	L10	8	9 not 1	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:16	

	Error Definition	Err ors
9		
10		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
11	BRS	L11	35	(combin\$3 near3 delay\$3 or summ\$3 near3 delay\$3 or add\$3 near3 delay\$3 or subtract\$3 near3 delay\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 add\$3 or first adj3 second adj2 delay\$3 near3 combin\$3 or plural\$3 adj2 delay\$3 near3 combin\$3 or multi\$3 adj2 delay\$3 near3 combin\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 combin\$3 or first adj2 delay\$3 near3 second adj2 delay\$3 near3 sum\$5) with (ris\$3 near3 time or ris\$3 near2 period or ris\$3 near2 interval\$3 or lead\$3 near2 edg\$3 or rais\$3 near2 time or ris\$3 near2 edg\$3 or lag\$4 near3 edg\$3 or lag\$4 near3 time or fal\$4 near3 time\$1 or fal\$4 near2 eddg\$3 or fail\$4 near2 edg\$3) same transmit\$4	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 17:18	
12	BRS	L12	0	11 not 1	US- PGPUB ; USPAT ; EPO; JPO	2006/04/2 8 17:18	

	Error Definition	Err ors
11		
12		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
13	BRS	L13	1893	(ris\$3 near3 circuit\$3 or lead\$3 near3 circui\$3 or rais\$3 near3 circuit\$3 or ris\$3 near3 edg\$3 or fall\$3 near3 circuit\$3 or lag\$4 near3 circuit\$3 or lag\$4 near2 edg\$3 or fail\$3 near2 circuit\$3) with (transition\$1 near2 time\$1 or time near2 period\$1 or time near2 interval\$1 or time near2 control\$4 or transition\$1 near3 control\$4) same (CLOCK\$1 or VCO\$1 or CLK\$1 or local adj2 oscillat\$4 or NCO\$1 or XVCO\$1 or crystal adj2 oscillat\$4)	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:24	
14	BRS	L14	1420	(ris\$3 near3 circuit\$3 or lead\$3 near3 circui\$3 or rais\$3 near3 circuit\$3 or ris\$3 near3 edg\$3 or fall\$3 near3 circuit\$3 or lag\$4 near3 circuit\$3 or lag\$4 near2 edg\$3 or fail\$3 near2 circuit\$3) with (transition\$1 near2 time\$1 or time near2 period\$1 or time near2 interval\$1 or time near2 control\$4 or transition\$1 near3 control\$4) with (CLOCK\$1 or VCO\$1 or CLK\$1 or local adj2 oscillat\$4 or NCO\$1 or XVCO\$1 or crystal adj2 oscillat\$4)	US-PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:25	

	Error Definition	Err ors
13		
14		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
15	BRS	L15	1301	(ris\$3 near2 circuit\$3 or lead\$3 near2 circuit\$3 or rais\$3 near2 circuit\$3 or ris\$3 near2 edg\$3 or fall\$3 near2 circuit\$3 or lag\$4 near2 circuit\$3 or lag\$4 near2 edg\$3 or fail\$3 near2 circuit\$3) with (transition\$1 near2 time\$1 or time near2 period\$1 or time near2 interval\$1 or time near2 control\$4 or transition\$1 near2 control\$4) with (CLOCK\$1 or VCO\$1 or CLK\$1 or local adj2 oscillat\$4 or NCO\$1 or XVCO\$1 or crystal adj2 oscillat\$4)	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:26	

	Error Definition	Err ors
15		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
16	BRS	L16	270	(ris\$3 near2 circuit\$3 or lead\$3 near2 circuit\$3 or rais\$3 near2 circuit\$3 or ris\$3 near2 edg\$3 or fall\$3 near2 circuit\$3 or lag\$4 near2 circuit\$3 or lag\$4 near2 edg\$3 or fail\$3 near2 circuit\$3) with (transition\$1 near2 time\$1 or time near2 period\$1 or time near2 interval\$1 or time near2 control\$4 or transition\$1 near2 control\$4) with (PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1 or edge near2 circuit\$3 or edge near2 detect\$3)	US- PGPUB ; USPAT EPO; JPO	2006/04/28 17:28	

	Error Definition	Err ors
16		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
17	BRS	L17	0	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or rais\$4 adj2 transiton\$1 adj1 time or rais\$4 adj2 transition\$1 adj2 interval\$1 or rais\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) and 16	US- PGPUB USPAT ; EPO; JPO	2006/04/28 17:31	

	Error Definition	Err ors
17		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
18	BRS	L18	4	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or rais\$4 adj2 transiton\$1 adj1 time or rais\$4 adj2 transition\$1 adj2 interval\$1 or rais\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) and 13	US- PGPUB USPAT ; EPO; JPO	2006/04/28 17:40	

	Error Definition	Err ors
18		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
19	BRS	L19	2	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or rais\$4 adj2 transiton\$1 adj1 time or rais\$4 adj2 transition\$1 adj2 interval\$1 or rais\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) and 14	US- PGPUB USPAT ; EPO; JPO	2006/04/28 17:31	

	Error Definition	Err ors
19		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
20	BRS	L20	2	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or rais\$4 adj2 transiton\$1 adj1 time or rais\$4 adj2 transition\$1 adj2 interval\$1 or rais\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) and 15	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:32	
21	BRS	L21	4	18 or 19 or 20	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:32	

	Error Definition	Err ors
20		
21		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
22	BRS	L22	1	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or rais\$4 adj2 transiton\$1 adj1 time or rais\$4 adj2 transition\$1 adj2 interval\$1 or rais\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) with (PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1 or edge near2 circuit\$3 or edge near2 detect\$3 or delay\$3 adj3 control\$4 adj2 loop\$1 or PDLL\$1 or DDLL\$1)	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:41	

	Error Definition	Err ors
22		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
23	BRS	L23	3	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period) same(PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1 or edge near2 circuit\$3 or edge near2 detect\$3 or delay\$3 adj3 control\$4 adj2 loop\$1 or PDLL\$1 or DDLL\$1)	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:44	

	Error Definition	Err ors
23		

	Type	L #	Hits	Search Text	DBs	Time Stamp	Comments
24	BRS	L24	3	(fal\$4 adj2 transiton\$1 adj1 time or fal\$4 adj2 transition\$1 adj2 interval\$1 or fal\$4 adj2 transition\$1 adj2 period or lag\$4 adj2 transiton\$1 adj1 time or lag\$4 adj2 transition\$1 adj2 interval\$1 or lag\$4 adj2 transition\$1 adj2 period or fail\$4 adj2 transiton\$1 adj1 time or fail\$4 adj2 transition\$1 adj2 interval\$1 or fail\$4 adj2 transition\$1 adj2 period or ris\$4 adj2 transiton\$1 adj1 time or ris\$4 adj2 transition\$1 adj2 interval\$1 or ris\$4 adj2 transition\$1 adj2 period or lead\$3 adj2 transiton\$1 adj1 time or lead\$3 adj2 transition\$1 adj2 interval\$1 or lead\$3 adj2 transition\$1 adj2 period or trail\$4 adj2 transiton\$1 adj1 time or trail\$4 adj2 transition\$1 adj2 interval\$1 or trail\$4 adj2 transition\$1 adj2 period or trail\$4 adj2 transiton\$1 adj1 time or trail\$4 adj2 transition\$1 adj2	US- PGPUB ; USPAT ; EPO; JPO	2006/04/28 17:48	

				interval\$1 or trail\$4 adj2 transition\$1 adj2 period or trail\$4 adj2 transiton\$1 adj1 time or trail\$4 adj2 transition\$1 adj2 interval\$1 or trail\$4 adj2 transition\$1 adj2 period) same(PLL\$1 or phase adj2 lock\$3 adj2 loop\$1 or DLL\$1 or delay\$3 adj2 lock\$3 adj2 loop\$1 or edge near2 circuit\$3 or edge near2 detect\$3 or delay\$3 adj3 control\$4 adj2 loop\$1 or PDLL\$1 or DDLL\$1)			
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	Error Definition	Err ors
24		

US-PAT-NO: 6114890

DOCUMENT-IDENTIFIER: US 6114890 A

****See image for Certificate of Correction****

TITLE: Skew-reduction circuit

----- KWIC -----

Brief Summary Text - BSTX (10):

In FIG. 1B, the clock signal has a skew because a transition period of signal rise is short (steep rise) and a transition period of signal fall is long (slow fall). In this case, the period T_{high} and the period T_{low} have different time lengths from those of FIG. 1A. This means that not only is each period elongated or shortened from a normal length thereof, but also a signal-rise timing and a signal-fall timing deviate from their expected timings.

Brief Summary Text - BSTX (12):

Various factors contribute to generating a rise-and-fall skew. In a signal-output circuit for outputting signals, transition periods are different between a signal rise and a signal fall because of variations in circuit characteristics. That is, a rise-and-fall skew is present even at a point where signals are output from circuits. Further, if a reference voltage V_{ref} used for comparison with input signals fluctuates in input buffers for receiving signals, the period T_{high} and the period T_{low} end up varying. Moreover, a transition period of signal rise and a transition period of signal fall may be different from each other in input buffers because of a variation in circuit characteristics, serving as another factor to create a rise-and-fall skew.

Brief Summary Text - BSTX (37):

In the circuit described above, the clock signal is compared with the delayed clock signal obtained by delaying the clock signal by a predetermined delay amount, and phases of rising edges and falling edges of the clock signal are adjusted based on the above comparison such that the clock signal has a HIGH-level period and a LOW-level period equal to each other, thereby reducing a rise-and-fall skew of the clock signal. Further, the same phase adjustment that is applied to the clock signal is also applied to other signals, thereby reducing rise-and-fall skews in the other signals. The phase adjustment of the rising edges and falling edges is readily achieved by controlling a transition period of each edge. Since the transition period can be changed by adjusting a power to drive signals, a circuit having a relatively simple configuration can implement the phase-adjustment function.

Brief Summary Text - BSTX (58):

In the circuit described above, phases of rising edges and falling edges of